INTERNATIONAL SEARCH REPORT

	International application No.
	PCT/US04/22268

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7)   :   G09G 5/00
US CL   :   345/629

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
    U.S. : 345/629, 630, 634, 753, 756, 757, 758

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 6,353,450 B1 (DeLeeuw) 05 Mar 2002, column 2, line 53- column 19, line 45	1-12, 14-20, 22-28, 30-39 13, 21
A	US 6,140,994 (Schaffstein et al.) 31 Oct 2000,	1-28, 30-39
Y	US 2002/0097247 (Obba) 25 Jul 2002, [0035]-[0140]	1-28,30-39
A	US 5,687,306 (Blank) 11 Nov 1997	1-28, 30-39

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 October 2004 (26.10.2004)	**15 NOV 2004**
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230	Authorized officer Michael Razavi Telephone No. (703) 305-4700

Form PCT/ISA/210 (second sheet) (January 2004)

AMENDED CLAIMS
[received by the International Bureau on 17 January 2005 (17.01.05) ;
claims 1-11, 14-39 amended, claims 40-48 added, remaining claims unchanged (6 pages)]

1.   A method for controlling a computer using at least one video image of a
     plurality of video images, the method comprising:
     (a)   capturing n video streams, n being an integer of at least two, the
           n video streams each comprising a plurality of video frames and
           each comprising an image of a user;
     (b)   determining a location of an object in at least one of the n video
           streams;
     (c)   controlling a program executing on the computer based on the
           location of the object;
     (d)   combining the n video streams with a user interface stream
           generated by the computer operating system, thereby forming a
           composite video stream; and
     (e)   displaying the composite video stream.

2.   The method of claim 1 wherein capturing n video streams includes
     receiving a live video signal of a user generated by a video camera.

3.   The method of claim 1 wherein capturing n video streams includes
     receiving a stored video signal from a video storage device.

4.   The method of claim 1 wherein determining the location an object in at
     least one of the n video streams includes:
     (a)   searching for a predetermined color in one of the n video streams;
     (b)   in response to locating the predetermined color, identifying an
           occurrence of the predetermined color having the largest area;
           and
     (c)   determining coordinates of the center of the occurrence of the
           predetermined color having the largest area.

5.   The method of claim 1 wherein controlling a program executing on the
     computer based on the location of the object comprises:
     (a)   analyzing motion of the object in successive video frames to
           determine presence of a control event; and
     (b)   controlling the program based on the control event.

AMENDED SHEET (ARTICLE 19)

6.   The method of claim 5 wherein each of the n video streams comprises
      an image of a different computer user, the object comprises an object
      associated with a user's hand, and the control event comprises a pointer
      movement event.

7.   The method of claim 5 wherein each of the n video streams comprises
      an image of a different computer user, the object comprises an object
      located in a user's hand, and the control event comprises a mouse click
      event.

8.   The method of claim 1 wherein combining the n video streams with the
      user interface stream generated by the computer operating system
      includes horizontally reversing frames of the n video streams to produce
      a mirror image of the frames of the n video streams.

9.   The method of claim 1 wherein combining the n video streams with the
      user interface stream generated by the computer operating system
      includes transparently overlaying the user interface stream on the n
      video streams.

10.   The method of claim 1 wherein combining the n video streams with the
      user interface stream generated by the computer operating system
      includes transparently overlaying the n video streams on the user
      interface stream.

11.   The method of claim 1 wherein combining the n video streams with the
      user interface stream generated by the computer operating system
      includes:

      (a)   adjusting a transparency level of at least one of the user interface
            stream and the n video streams; and

      (b)   generating the composite stream from the user interface stream
            and the n video streams.

12.   The method of claim 11 wherein adjusting the transparency level
      includes dynamically adjusting the transparency level.

13.   The method of claim 1 wherein displaying the composite video stream
      includes projecting the composite video stream.

14. The method of claim 1 wherein each of the n video streams comprises an image of a different user and wherein the program comprises a collaborative desktop application.

15. The method of claim 14 wherein the collaborative desktop application allows each user to control his or her own mouse pointer on a shared desktop.

16. The method of claim 1 wherein each of the n video streams comprises an image of a different user, wherein at least some of the users are in different locations and wherein the program comprises a distributed computer programming application.

17. A method for combining a plurality of video images, each containing an image of a user, with a computer desktop interface, the method comprising:

    (a) capturing n video streams, n being an integer of at least two, each video stream comprising a plurality of frames and each comprising an image of a user;

    (b) transparently combining the n video streams with a computer desktop generated by the computer operating system, thereby forming a composite video stream; and

    (c) displaying the composite video stream, wherein the composite image includes transparent images of the users displayed with the computer desktop.

18. The method of claim 17 wherein capturing the n video streams includes receiving a live video signal generated by a video camera.

19. The method of claim 17 wherein combining the n video streams with the user interface stream generated by the computer operating system includes horizontally reversing frames of the n video streams to produce a mirror image of the frames of the n video streams.

20. The method of claim 17 wherein combining the n video streams with the user interface stream generated by the computer operating system includes:

(a)   adjusting a transparency level of at least one of the user interface stream and the n video streams; and

(b)   generating the composite stream from the user interface stream and the n video streams.

21.   The method of claim 20 wherein adjusting the transparency level includes dynamically adjusting the transparency level.

22.   The method of claim 17 wherein displaying the composite video stream includes projecting the composite video stream.

23.   The method of claim 17 wherein displaying the composite video stream includes displaying the composite video stream on a non-projection computer display device.

24.   The method of claim 17 wherein displaying the composite video stream includes displaying a mirror image of each user with the desktop.

25.   The method of claim 17 comprising controlling objects on the desktop in response to movement of at least one of the user images.

26.   The method of claim 25 wherein controlling objects on the desktop includes moving objects on the desktop.

27.   The method of claim 25 wherein controlling objects on the desktop includes activating programs associated with objects on the desktop.

28.   The method of claim 17 wherein the desktop comprises the desktop of a computer local to at least one of the users.

29.   The method of claim 17 wherein the desktop comprises the desktop of a computer remote from at least one of the users.

30.   The method of claim 17 wherein each of the plurality of video streams includes an image of a different user.

31.   The method of claim 30 wherein the different users comprise collaborators in distributed computer programming task.

32.   The method of claim 30 comprising controlling desktop objects in response to movement of user images in any of the video streams.

33.   A computer-readable storage medium containing a set of computer-executable instructions, the set of instructions comprising:

(a)   n video stream capturing routines, n being an integer of at least
        two, each of the video stream capturing routines for capturing a
        different video stream, each video stream comprising a plurality of
        video frames and an image of a user;

(b)   a video frame analysis routine for determining a location of an
        object in at least some of the plurality of video frames;

(c)   a driver for controlling a program executing on the computer
        based on the location of the object;

(d)   a video compositing routine for combining the n video streams
        with a user interface stream generated by the computer operating
        system, thereby forming a composite video stream; and

(e)   a video display routine for displaying the composite video stream.

34.   The computer-readable storage medium of claim 33 wherein the user
      interface driving routine comprises:

(a)   instructions for searching for a predetermined color in at least one
        of the n video streams;

(b)   instructions for identifying an occurrence of the predetermined
        color having a largest area; and

(c)   instructions for determining the coordinates of the center of the
        occurrence of the predetermined color having the largest area.

35.   The computer-readable storage medium of claim 33 wherein the video
      compositing routine comprises:

(a)   instructions for adjusting the transparency level of at least one of
        the user interface stream and the n video streams; and

(b)   instructions for generating the composite stream from the user
        interface stream and the n video streams.

36.   The computer-readable storage medium of claim 33 wherein the video
      compositing routine comprises instructions for horizontally reversing
      images of the n video streams to produce a mirror image of the images
      of the n video streams.

37.   The computer-readable storage medium of claim 33 wherein each of the
      n video streams comprises an image of a different user.

AMENDED SHEET (ARTICLE 19)

38. The computer-readable storage medium of claim 37 wherein at least some of the users are in different locations.

39. The computer-readable storage medium of claim 38 wherein the different users comprise collaborators in a distributed computer programming task.

40. A computer program product comprising computer-executable instructions embodied in a computer-readable medium for performing steps comprising:

    (a) receiving n video images, n being an integer of at least two, each video image including an image of a computer user;

    (b) combining the n video images with a computer desktop image;

    (c) displaying the combined image;

    (d) tracking a portion of at least one of the n video images in the combined image; and

    (e) manipulating objects in the desktop image based on the tracked portion.

41. The computer program product of claim 40 wherein manipulating objects includes highlighting the objects.

42. The computer program product of claim 40 wherein manipulating objects includes moving the objects.

43. The computer program product of claim 40 wherein manipulating objects includes activating programs associated with the objects.

44. The computer program product of claim 40 wherein each video image includes an image of a different user.

45. The computer program product of claim 44 wherein the different users comprise collaborators in a distributed computer programming task.

46. A computer system comprising:

    (a) a display device;

    (b) n video cameras for producing n video streams, n being an integer of at least two, each video stream including an image of a user; and

(c)   a processing unit operatively coupled to the display device and the n video cameras, wherein the processing unit is adapted to:

     (i)   receive the n video streams, each video stream comprising a plurality of video frames;

     (ii)   determine a location of a predetermined object associated with a user in at least one of the plurality of video frames; and

     (iii)   control execution of a program based on the location of the object.

47.   The system of claim 46 wherein the n video cameras are each positioned to produce a video stream including an image of a different user.

48.   The system of claim 47 wherein the different users comprise collaborators in a distributed computer programming task.